MEMORANDUM

Missouri Department of Transportation
Project Manager
Saint Louis District

TO: Eric Schroeter
State Design Engineer

CC: Jim Smith - de

FROM: Tim Schroeder
Transportation Project Manager

DATE: November 1, 2013

I do hereby certify that in accordance with the requirements of 23 CFR 635.411(a)(2), no equally suitable alternate exists for this patented or proprietary item.

Eric Schroeter State Design Engineer

SUBJECT: Route V, St. Charles County
Mill and Fill with Pavement Reinforcement Grid - Job No. J6M0257
Proprietary Item (Glas Grid and Mirafi)
Proprietary Item Certification Request

With respect to the above named project, we request a Proprietary Item Certification to use either Glas Grid or Mirafi Pavement Reinforcement Grid.

This project includes pavement improvements on Route V, from Canvas Back Road to just south of Woodland Park Road. Route V is experiencing severe distress at the edge of the travelled way. The majority of the pavement failures occur in the northbound lane with a small section in the southbound lane in front of Block Marine Service. MoDOT Maintenance forces have patched and overlaid this road repeatedly over the years. However, the outside edge of pavement has begun to break up and slide into the adjacent ditch.

Testing of current conditions

Four cores were taken in the failure areas, followed by additional exploration with continuous flight augers. Drilling entailed coring the asphalt, and then obtaining samples of the underlying soil from the augers. Based on observations in the field, static cone penetrometer readings, and cores, the following conclusions can be drawn:

- While the most recent asphalt overlays are in relatively fair condition, the underlying asphalt overlays are experiencing varying degrees of stripping and at times are completely stripped. The new surface and maintenance asphalt has little chance for success as the underlying asphalt is yielding differentially. Furthermore, the addition of each subsequent lift is adding more load on an already unstable roadbed.
- The soils encountered under the asphalt are highly plastic gray clay and silt, with the presence of abundant moisture. As a general rule, increasing plasticity leads to a greater shrink/swell potential. Therefore, during wet periods these soils swell significant and negatively impact the asphalt. During dry periods, these soils shrink and voids develop in the subgrade, result in the current edge voids.
- Cores showed up to nineteen inches of asphalt underlain by highly plastic gray clay and silt. Augers were pushed without turning to a maximum depth of twenty feet. In addition,

a static cone penetrometer was pushed through the upper 20" of the subgrade after the asphalt cores were extracted. The California Bearing Ratio was found to be extremely low with values of less than three, indicating soft conditions that provide little support for the roadway.

- A ditch on the eastern side of Route V ultimately dumps into Twin Lake to the north and eventually the Mississippi River. This ditch holds backflow water from the Mississippi River during high water stages, providing a conduit for water to enter the subgrade.

In summary Route V failed for several reasons. The poor subgrade forced the underlying asphalt to yield instead of flex. The almost constant presence of water continues to strip away the asphalt binder on those lower asphalt lifts. The addition of multiple lifts and patches has ultimately provided little more than additional load on an already weakened subgrade. Eventually the binder failed and began to break apart, taking the new asphalt with it.

Synchronization with the Current System

In an effort to add structure to the existing pavement, we plan on milling the existing surface 3", placing 1" BP-2, then place a reinforcement grid, then place 2" of BP-2. The grid would distribute the load, thus the problem of the underlying stripped asphalt is theoretically eliminated. With the low volumes experienced on Route V, this application could easily get over fifteen years of service. There are currently two choices: Glas Grid by Tensar and Mirafi PGM-G4 by TenCate. Glas Grid has been used in the Kansas City area, and Mirafi has been used on a test section in St. Charles County. We request to use either product on this route.

Discussion of Alternatives:

Total Reconstruction: MoDOT forces rebuilt sections of Route P in St. Charles County after severe rains washed out the roadway in May of 2008. MoDOT forces sawcut the roadway at the centerline and excavated the deposited material that remained. Shot rock was placed to establish a good foundation and the road was rebuilt. By utilizing that application here, the placed rock will allow water from the existing ditch to drain from the subgrade without losing any load bearing ability. The stripped asphalt will be removed, and a stable platform will be in place to rebuild the pavement. However, in today's economic climate and with the low volumes experienced on Route V, this option is cost prohibitive.

Overlay: Additional asphalt overlays could be performed on the existing roadway, but they will not give the expected long term performance and will have the same issues as the previous asphalt overlays exhibit on this route.

In conclusion, we certify that no suitable alternative exists.

Project Schedule

This project is scheduled for a January 2014 bid opening. The project is funded with District Maintenance funds.